UNITED STATES PATENT AND TRADEMARK OFFICE

C/C

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,195	10/27/2003	Jacqueline C. Timans	DX0904KB	4584

28008 7590 10/24/2005

DNAX RESEARCH, INC.
LEGAL DEPARTMENT
901 CALIFORNIA AVENUE
PALO ALTO, CA 94304

EXAMINER	
MERTZ, PREMA MARIA	
ART UNIT	**PAPER NUMBER**
1646	

DATE MAILED: 10/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/695,195	TIMANS, JACQUELINE C.	
	Examiner	Art Unit	
	Prema M. Mertz	1646	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-25* is/are pending in the application.

4a) Of the above claim(s) *25* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/27/2003*.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. 10/6/05
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

SD

DETAILED ACTION

Election/Restrictions

1. Applicant's election of claims 21-24 in the reply filed on 9/21/2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim 25 is withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention.

Specification

2a. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

2b. On page 3, lines 10-11, there are dashes in the specification after "IL-1_" because the species of IL-1 has not been recited. Appropriate correction is required.

Claim rejections-35 USC § 101/35 USC § 112, first paragraph

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 21-24 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a credible, specific and substantial asserted utility or a well established utility.

The claims are directed to a polypeptide of amino acid sequence set forth in SEQ ID NO: 2, kits comprising same, and compositions comprising the same. The specification asserts that the invention has utility in that the IL-1ζ is expected to have interleukin-1 like activities based on its structural similarity with known interleukins.

For example, the specification asserts that:

"The IL-1 ζ polypeptides will have a number of different biological activities, e.g., in the immune system, and will include inflammatory functions or other innate immunity responses. The IL-1 ζ polypeptides are homologous to other IL-1 proteins, but each have structural differences. For example, a human IL-1γ gene coding sequence probably has about 70% identity with the nucleotide coding sequence of mouse IL-1γ, and similar measures of similarity will likely apply to the IL- ζ. At the amino acid level, there is also likely to be about 60% identity. This level of similarity suggests that the new IL-1ζ proteins are related to the other IL-1α, IL-1β, IL-1RA, IL-1γ, IL-1δ, and IL-1ε."

(page 20, lines 21-32).

The assertion that the disclosed IL-1ζ protein has biological activities similar to known IL-1 polypeptides cannot be accepted in the absence of supporting evidence, because the relevant literature reports examples of polypeptide families wherein individual members have distinct, and sometimes even opposite, biological activities. This is especially true for IL-1 polypeptides, as admitted in the specification at page 3, lines 10-14, wherein it is stated that:

"The interleukin-l family of proteins includes the IL-1_, the IL-1_, the IL-IRA, and recently the IL-1_ (also designated Interferon-Gamma Inducing Factor, IGIF). This related family of genes has been implicated in a broad range of biological functions."

The instant specification does not disclose a specific receptor to which SEQ ID NO: 2 binds. Finally, note Kumar et al. (2000, J. Biol. Chem. 275:10308-10314) who disclose that lL-1δ is an antagonist of IL-1ε, even though both polypeptides belong to the IL-1 family.

Other cytokine or growth factor polypeptide families are also known in the art to have different biological activities, despite a close structural relationship. For example, Tischer et al. (U.S. Patent 5,194,596) establishes that VEGF (a member of the PDGF, or platelet-derived growth factor, family) is mitogenic for vascular endothelial cells but not for vascular smooth muscle cells, which is opposite to the mitogenic activity of naturally occurring PDGF which is mitogenic for vascular smooth muscle cells but not for vascular endothelial cells (column 2, line 46 to column 3, line 2). The differences between PDGF and VEGF are also seen in vivo, wherein endothelial-pericyte associations in the eye are disrupted by intraocular administration of PDGF but accelerated by intraocular administration of VEGF (Benjamin et a1., 1998, Development 125:1591-1598, see Abstract and pp. 1594-1596).
In the transforming growth factor (TGF) family, Vukicevic et al. (1996, PNAS USA 93:9021-9026) disclose that OP-1, a member of the TGF- β family of proteins, has the ability to induce metanephrogenesis, whereas closely related TGF-β; family members BMP-2 and TGF-β1 had no effect on metanephrogenesis under identical conditions (p. 9023, paragraph bridging columns 1-2).

Generally, the art acknowledges that function cannot be predicted based solely on structural similarity to a protein found in the sequence databases. For example, Skolnick et al. (2000, Trends in Biotech. 18:34-39) state that knowing the protein structure by itself is insufficient to annotate a number of functional classes, and is also insufficient for annotating the specific details of protein function (see Box 2, p. 36).

Therefore, based on the discussions above concerning the specific examples of structurally similar proteins that have different functions, along with the art's recognition that one cannot rely upon structural similarity alone to determine functionality for new members of cytokine or growth factor polypeptide families, the assertion that the IL-1ζ polypeptide recited in the claims has activities similar to previously characterized IL-1 polypeptides is not substantial. Significant further research would have been required of the skilled artisan to characterize the polypeptide of SEQ ID NO: 2 to determine its particular biological activities or other specific utilities.

In view of the evidence in the art that structural similarity between soluble polypeptides like interleukins, as well as other cytokines and growth factors, cannot accurately predict functional similarity, there is also no well-established utility for newly isolated IL-1ζ.

The specification asserts several utilities for IL-1ζ that are not necessarily related to its biological activities; however, none of these asserted utilities meets the three-pronged test of being credible, specific and substantial. Each will be addressed in turn:

a) *IL-1ζ or its binding compounds can be used in therapy*: This asserted utility is credible, but it is not specific or substantial. In particular, the specification states at page 20, lines 21-24, that:

"The IL-1ζ polypeptides will have a number of different biological activities, e.g., in the immune system, and will include inflammatory functions or other innate immunity responses."

Additionally on page 71, lines 1-5, the specification states that:

"IL-lζ being homologous members of the IL-1 family likely play a role in modulating of local and systemic inflammatory processes,"

but does not state what the role is, what types of inflammation involve IL-1ζ, or how IL-1ζ modulates the inflammation. The specification provides no clear nexus between any particular inflammatory state and any specific change in IL-1ζ form or quantity. Since significant further research would be required before IL-1ζ could be used in a real-world treatment of a specific disease, the asserted utility is not substantial. Also, a diverse group of chemical and environmental stimuli can be said to "play a role in modulating of local and systemic inflammatory processes", including cytokines, aspirin, lye, scratches, and ice. Some of these enhance inflammation (e.g., certain cytokines, lye, scratches) whereas others relieve inflammation (e.g., other cytokines, aspirin, ice). However, all of these diverse stimuli can be said to "modulate" or "play a role" in inflammation. Therefore, the assertion that IL-1ζ plays a role in modulating inflammation is not a specific assertion of utility.

b) *IL-I ζ can be used to screen for receptors, agonists or antagonists*: This asserted utility is credible and substantial, but it is not specific. The same can be done with any structurally and functionally unrelated polypeptide.

c) *IL-1ζ can be used as a disease marker or as a tissue marker:* The specification does not provide a nexus between any particular disease state and an alteration in forms or levels of IL-1ζ. Again, the specification asserts that IL-1ζ: "likely plays a role in modulating of local and

systemic inflammatory processes", and does not state what the role is, what types of inflammation involve IL-1ζ, or how IL-1ζ forms or levels are changed in inflamed tissues. Therefore, the assertion that IL-1ζ can be used as an inflammation disease marker is credible, but it is not specific or substantial. Significant further research would be required to discover the nexus between a particular disease state and a particular alteration in IL-1ζ forms or levels. Use as a tissue marker is credible, but it is not specific. Numerous structurally and functionally unrelated proteins can be used as tissue markers based on their expression patterns. This asserted utility is also not substantial since the tissue specific pattern of expression for SEQ ID NO: 2 was not disclosed in the specification, and would have to be determined empirically by the skilled artisan.

d) *IL-1ζ can be used to make antibodies, and the antibodies can be used to identify IL-1ζ.* This asserted utility is credible, but not specific or substantial. Antibodies can be made from any protein. Also, there is no indication of how to use the antibodies in a real-world use.

Therefore, since the specification does not disclose a specific, substantial and credible utility for the claimed binding compounds or the polypeptide they bind, the claims are rejected under 35 U.S.C. 101 for lack of utility.

Claims 21-24 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a credible, specific and substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

Claim rejections-35 USC § 112, second paragraph

4. Claims 22-24 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 22 is rejected as vague and indefinite for reciting "a glycosylation or phosphorylation". It is unclear what the metes and bounds of this term are.

Claim 23 is rejected as vague and indefinite for reciting the phrase "including" because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 24, line 2, is rejected as vague and indefinite for reciting "and/or". It is unclear whether the instructions for use or disposal of reagents in the kit are part of the kit. It is suggested that the term "or" be deleted from the claim.

Conclusion

No claim is allowed.

Claims 21-24 are rejected.

Advisory Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prema Mertz whose telephone number is (571) 272-0876. The examiner can normally be reached on Monday-Friday from 7:00AM to 3:30PM (Eastern time).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Caputa, can be reached on (571) 272-0829.

Official papers filed by fax should be directed to (571) 273-8300. Faxed draft or informal communications with the examiner should be directed to (571) 273-0876.

Information regarding the status of an application may be obtained from the Patent application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Prema Mertz

Prema Mertz Ph.D., J.D.
Primary Examiner
Art Unit 1646
October 6, 2005